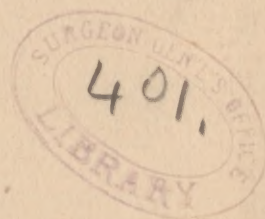


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NOTES ON THE PREVENTION OF PULMO-  
NARY CONSUMPTION.

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## NOTES ON THE PREVENTION OF PULMONARY CONSUMPTION.

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Consumption is a disease which depends for its origin upon infection by a micro-organism known as the bacillus tuberculosis of Koch, and while it is true that the most careful researches fail to demonstrate its presence in about ten per cent. of well developed cases of pulmonary consumption, it is conceded by a vast majority of authorities that without bacilli there is no consumption, and that they can be found in every case at some stage or another, and always post-mortem.

United as to the source of infection, observers differ widely regarding the question of direct contagion from a diseased person to a healthy one. Excellent authorities have written upon the side of those who proclaim that the danger of contagion lies in the air exhaled by the patient, and Hermann Weber has gone so far as to speak of cases of direct infection between husband and wife. After a careful study of the subject, the writer has arrived at the conclusion that there are no cases on record which prove that consumption is transmissible from person to person. All instances quoted by those teaching the contrary views can be explained by the results obtained through Dr. Cornet's experiments.

The invasion of the bacilli into the human organism takes place through either the respiratory or the alimentary tract, although cases are known in which the bacilli found their entrance into the system through an abrasion in the integument.

The most frequent channels of infection are the air passages. Considering the large quantities of bacilli which are constantly expectorated by phthysical patients, and the carelessness with which both the medical profession and the laity treat such expectorations, it is fair to presume that ordinary atmosphere, such as we breathe in our large cities, is loaded with bacilli, and that every human being inhales them frequently. Extensive observations have proven that individuals living upon a high physiological plane are comparatively free from danger of infection, and that a certain disposition does exist in most instances which enables the bacilli to invade the human organism successfully. Although it is difficult to give a perfect definition of such disposition, certain changes have



been demonstrated to exist in most cases, and we are in a position to-day to predict the development of pulmonary consumption with a considerable degree of accuracy if well defined anatomical and functional derangements exist, and if the subject is exposed to the danger of infection.

Conspicuous among the animals liable to tuberculosis are cattle, and, in a less marked degree, sheep, hogs, chickens, rabbits, etc.

The time allowed for this paper prevents the discussion of the danger of infection from the use of milk or meat derived from tubercular animals: suffice it to say that such danger exists, and that it deserves more attention than it receives at present.

Intelligent supervision of animals which furnish food for the human race is an essential factor in carrying on a successful struggle against the development of pulmonary consumption. No one, however, will contradict the statement that the vast majority of all cases of pulmonary consumption are acquired by people favorably disposed to the development of the disease by inhaling the deadly bacilli. To make any progress in our efforts to prevent the development of pulmonary consumption, we have to concentrate our endeavor in two directions,—first, to destroy or diminish the number of bacilli which float in the atmosphere; and, second, to prevent the development of the disposition of the human organism to acquire consumption. In proportion as we succeed in either direction we shall diminish pulmonary consumption.

If we could devise means to destroy all the bacilli which float in the atmosphere, the most important progress in medical history would be recorded, but there are no indications visible anywhere that would encourage labor in that direction, and our best efforts must be made in the direction of diminishing the quantity of bacilli which surround us. Considering the fact that probably one sixth part of the entire human race suffers from tuberculosis at some time or another, and that every phthisical patient is the source of millions of tubercular bacilli, the difficulty of even this undertaking becomes apparent.

Isolation of all consumptives has been suggested, and will be discussed at the next International Congress for Tuberculosis, to be held in Paris early next year. A number of distinguished members of the medical profession have expressed views favorable to such a plan, but the writer cannot permit this opportunity to pass without placing himself on record as utterly opposed to it. Isolation was practised long before Koch demonstrated the bacillus of tuberculosis.

In<sup>1</sup> Naples and in Portugal laws existed a hundred years ago which placed consumption upon equal footing with pestilence and small-pox. The laws in Naples were of the most stringent character, and existed in the same form for about fifty-five years, without affecting the prevalence of consumption to any marked degree.

If the advocates of isolation would reflect for a short time, and consider the hardship and injury which would follow its introduction, affecting

<sup>1</sup> Berliner Klinische Wochenschrift, 1883, No. 24.

as it would a large proportion of the human race and seriously interfering with our entire social life, without giving the slightest assurance of better results than those obtained after many years of trial in Naples and Portugal, one would think that they would hesitate to advocate so inhuman a proposition. It will not be denied by them that a very large proportion of consumptives are phthisical subjects long before they themselves are aware of it; and even physicians frequently treat "alveolar catarrh" as bronchitis, until the microscope demonstrates the fact that the patient's expectorations are full of tubercular bacilli. What benefit would be derived by isolating advanced cases of pulmonary consumption, if cases during the early stages are permitted to deposit millions of microbes with their expectorations upon our streets, in our churches, public halls, railroads, and all over their own residences? And, finally, what advantage would isolation have if carried out in the state of New York and not in New Jersey or Pennsylvania, or if adopted by the United States and not in Canada?

Isolation is not only cruel, but it is entirely infeasible, and the sooner the medical mind is directed in other channels the better it will be. Even if isolation were practicable, the benefits derived therefrom would not be greater than would be the benefits if the spittoon were to obtain the position in our daily life to which it is entitled, or if proper attention were paid to disinfection of the patient's clothing and wash, the furniture and the floor, and if the carpet were banished from every dwelling inhabited by consumptives.

Of all the experimental researches and investigations made recently regarding the infectious nature of pulmonary consumption, those of Dr. George Cornet,<sup>1</sup> of Berlin, are of the greatest value, and it is only fair to say that through his labors the prophylaxis of pulmonary consumption has advanced to a scientific basis. His teachings should be preached wherever the general welfare of the masses is considered! Dr. Cornet's experiments should be our guide in our efforts to prevent the development of pulmonary consumption, for they demonstrate, first, that the consumptive *per se* is *not*, and, second, that the sputa *are*, the source of danger, not in the moist state, but decidedly so if dried, pulverized, and suspended in the air.

If the air which passes through pulmonary cavities and is afterwards exhaled by the patient is free from bacilli, if the sputa containing them are free from danger as long as they are moist, and if it is positively proven that dried sputa contain the bacilli and are of the most dangerous character, we have laid out for us a well defined plan to prevent the spreading of consumption. It is not necessary to isolate the unfortunate patients, or consider them personally dangerous to their surroundings, but it is of vital importance to destroy the bacilli contained in their expectorations as soon as possible, or to deprive them of the power of doing harm. To obtain this end it is necessary to apply means to keep the expectorations of consumptives (and as we are frequently in doubt

<sup>1</sup> Zeitschrift für Hygiene v. Bd., p. 192, Squ.



when coughing depends upon tubercular invasion, it would be safest to include all those suffering from disease of the lungs) in a moist state. To do this it is necessary that the masses learn to expectorate into spittoons,—not as it is customary now, into handkerchiefs,—and it would be advisable to teach the great importance of this lesson to our children in the schools, and never to cease preaching about it until it becomes the usual habit of people to do so. Where do we find to-day a receptacle for expectorations? Not in our public offices, not in large stores, not in our school-houses, not in railroad cars (except in Pullman palace cars), not in railroad stations, not in any place where large numbers of people assemble, not even in our houses; and yet it is a fact, that without such receptacles—partially filled with appropriate solutions and properly cleaned at frequent intervals—our efforts to prevent the development of consumption are futile.

The importance attached to the use of a receptacle for expectoration of even doubtful character by advanced phthisio-therapeutists is demonstrated by the fact that Dr. P. Dettweiler, of Falkenstein, presented a pocket flask before the last German Medical Congress, held in Wiesbaden in April, 1889, which is intended to be used by people who suffer from cough, if spittoons are not handy, and by the adoption of these flasks for use among his patients by Dr. Hermann Brehmer in Goerbersdorf. My friend Dr. P. Dettweiler kindly sent me a sample flask, and I present the same to this meeting for inspection and consideration. There seems to be room for improvement in the construction of the flask, but the theory which is involved in its use is an admirable and sound one, and is the foundation upon which all advance of preventive medicine relating to pulmonary consumption must rest.

Another very important step in the right direction is the prompt and sufficient disinfection of the patient's clothing, bedding, wash, furniture, and of the walls, the ceiling, and the floor of his apartments. It is essential that the soiled linen should not be allowed to accumulate, but it should be washed at frequent intervals and under proper precautions. Properly to clean carpets is so difficult an undertaking that the rooms occupied by consumptives should not be carpeted, linoleum being preferable.

Positive instructions should be given to patients suffering from cough never to swallow their expectorations. Aside from the fact that self-infection, producing tuberculosis of the intestines, is to be feared, the faeces containing tubercular bacilli would, if they are allowed to become dry (and such is the case in many instances), become the source of great danger.

If we have done our full duty regarding the dangerous expectorations, if the spittoon has been rehabilitated and even made one of the necessities of life, and we have convinced the popular mind thoroughly that consumption is a preventive disease, and that it is spread broadcast by carelessness principally, we may expect to see the number of deaths from consumption diminish.

The second duty of preventive medicine regarding pulmonary consumption is to diminish the probabilities for the development of the disposition to acquire the disease, and to protect those who present such disposition from the disease itself.

The bacteriologist pure and simple, the man who learned all he knows in the laboratory experimenting upon the lower animals, will dispute the importance of the disposition, and will say, "Before the tubercular bacilli all mankind is equal;" but he who has derived his knowledge from bedside observations and study of the diseased organs will unquestionably admit the danger to which those are exposed who present what Rokitansky so admirably describes as "phthysical habitus," viz., a small heart, situated in a chest of abnormally short anterior posterior diameter, with abnormally long perpendicular dimensions, containing large, voluminous lungs, and a proportionally small abdominal cavity. Of course not every one who carries with him a fertile soil for the development of the tubercular bacilli presents all the morphological and anatomical changes which make the phthysical habitus, nor does every one presenting these peculiarities described by Rokitansky acquire consumption; but to ignore the importance of his statements, or to deny the fact that the existence of the conditions included in the description of the phthysical habitus enables one to predict with a considerable degree of certainty the development of consumption at some future period, would mean that bedside and general clinical experience are of little value regarding the etiology of disease.

For the object under discussion now it is most important to demonstrate, if it can be done, under what circumstances and conditions the disposition referred to is developed,—whether it be possible to lessen the probabilities of producing offspring who carry with them the burden of such a predisposition, and, finally, whether we have means at our command to diminish the danger of acquiring consumption among those thus afflicted.

The question of inheritance has always been considered one of vital interest among those interested in the study of pulmonary consumption. The views now held generally deny the existence of "congenital tuberculosis;" but the disposition to acquire the disease is most commonly found among the offspring of consumptive parents, and about one third of all phthysical patients come from either paternal or maternal parentage suffering from consumption. Sometimes it may be difficult to decide whether the inherited disposition, or the long continued exposure to infection by means of bacilli derived from the dried sputa of the parents, is a greater source of danger to the offspring, but the importance of disposition becomes at once apparent if we follow the admirable and practical teachings of Dr. Hermann Brehmer, of Goerbersdorf, the recognized father of all practical phthiso-therapy, and investigate the patients' family histories extending back to their grandparents.

Without going into any details, the writer makes the statement that with a large experience among many cases of pulmonary consumption,



both in private and in hospital practice, he unhesitatingly indorses Dr. Brehmer's views as to the development of a disposition to acquire pulmonary consumption among the offspring of apparently healthy parents:

I. If there are many children in a family, those born after the sixth or after the seventh are apt to develop pulmonary consumption.

II. If several children in a family are born at short intervals, say one year, the younger ones are apt to develop pulmonary consumption.

III. If the offspring of healthy parents, born under conditions named above, escape the disease, their products are apt to develop pulmonary consumption.

These teachings are probably new to most of my hearers (the readers), but the writer has been convinced so thoroughly of their truth and importance regarding the prophylaxis of pulmonary consumption that he invites all members of the medical profession to go to work at once and put them to the practical test of clinical experience.

Patient and diligent inquiries into the family histories of many consumptives induce the writer to make the following strong statement: Only a small proportion of phthisical patients can be found who do not possess a family history which either demonstrates a directly inherited tendency, or a directly (section 1 and 2) or indirectly (section 3) acquired disposition towards the development of the disease.

A most interesting and valuable contribution to this important subject is given in Dr. Brehmer's recent publication,<sup>1</sup> investigating the previous history of those who visited his sanitarium in Goerbersdorf during the year 1888, and the following is a short digest of it: Five hundred and fifty-six patients visited the sanitarium during 1888, 4 patients suffered from other diseases than phthisis, 46 patients failed to give a satisfactory family history; of the remaining 506 cases, as many as 184, or  $36\frac{3}{10}$  per cent., were offspring of consumptive parents or grandparents, viz., 65 times from father's side, 76 times from mother's side, 14 times from both parents, 16 times from the father's parents, 12 times from the mother's parents, and twice from the grandparents of both father and mother. These figures demonstrate that in many instances (16 per cent.) phthisis is developed in subjects whose parents were apparently healthy, but were the offspring of phthisical parentage. Of the remaining 322 cases, as many as 109 belonged to families with many children, none of them, however, being higher in the scale than the sixth, and 38 cases belonged to families where the mother had children rapidly, mostly in intervals of one year. This group of "acquired disposition" embraces 147 cases (29 per cent.), only 7 per cent. less than that of "inherited disposition." Of the whole number of 506 cases, 175 remain unaccounted for, but 155 of them have it in common that the patients' parents have been born under conditions described in section 1, but have themselves escaped the development of phthisis to the date of writing; in 77 cases, the indirectly

<sup>1</sup> Mittheilungen aus Dr. Brehmer's Heilanstalt, Wiesbaden, 1889, p. 2. cc.



acquired disposition was derived from the father, who was at least the sixth child in 63 instances, and who was born only one year after the preceding child in 17 instances. The mother was the source of acquisition 65 times (respectively 54 and 11 times). Finally, there were 11 cases where both parents belonged to subjects classified in section 1. This leaves 22 cases out of 506, and of those 15 had it in common that either one of the patient's parents or grandparents were suffering from epilepsy, or were insane. Seven cases out of 506 did not present any conditions which would indicate a disposition to the development of pulmonary consumption.

The writer's own statistical notes do not cover so much material, and he found considerable difficulty in obtaining any reliable information about the patients' grandparents, but, generally speaking, Dr. Brehmer's researches have been verified by the writer's experience.

With such proofs before us, is it not our duty to teach those depending upon us for advice how offspring of healthy families are made to become predisposed to develop consumption, and that marriage of consumptives is to be strongly discouraged.

It is important to know what can be done to protect those with an inherited or acquired unfavorable disposition from becoming victims of the tubercular bacilli, and it is unfortunate that this important subject has been seriously neglected by those otherwise interested in the field of preventive medicine. We know that not all offspring of healthy parents with large families after the sixth child become consumptives, nor do all those born in close intervals with the other children, nor even those of consumptive parents, die of tuberculosis. There are, however, certain functional and structural changes, which, when found existing in young subjects, indicate serious danger of future tubercular infection. In line of their importance these deranged conditions of the human system are,—

1. Those anatomical changes in the formation of the chest which help to present what is known as the phthisical habitus.
2. The fact that the subject is and always has been a small feeder.
3. The fact that, during the age of puberty, the patient has suffered from palpitation of the heart.
4. The fact that, at the same time and frequently for years afterwards, the patient has been suffering from epistaxis (nose bleeding).

If these abnormal conditions, or part of them, are found in subjects whose family histories raise the sign of danger, it is necessary to use such means as will diminish the danger of future infection. Medication is of no value, but a transfer of the threatened subject to a proper climate will do much to prevent the future development of pulmonary consumption. The writer is thoroughly convinced that certain elevated regions enjoy comparative immunity from phthisis, and that a removal of those cases which warrant unfavorable prognosis regarding the development of consumption to such parts, would save many lives. The establish-

ment of a high school for both sexes at Davos Platz is a step in the right direction.<sup>1</sup>

The time allowed for this paper prevents anything like a thorough discussion of this highly interesting subject, but it is to be hoped that these notes will help to arouse the interest of this Association in this vital branch of preventive medicine.

<sup>1</sup> The selection of a calling for such subjects deserves the most careful consideration, and the prospect of living an out-door life should have great weight in deciding the question. Many instances are known to the writer where subjects who presented all the indications for becoming consumptives are in good health, living in certain elevated regions, and pursuing an out-door life.





